

## REMARKS

By this Amendment, claims 2-15 are pending in this application, with claims 2, 3, and 10 being independent claims. Claims 2, 3, and 9 have been allowed. Multiple dependent claims 4-8 have been amended to depend only from allowed independent claims 2 and 3, so as to place those claims in condition for allowance. Therefore, timely allowance of claims 2-9 is respectfully requested.

Claim 1 has been cancelled. In place of cancelled claim 1, claim 10 has been newly added to more clearly recite the subject matter of original claim 1. New dependent claims 11-15 have been added. These claims include the same subject matter contained in claims 4-8, respectively, and depend from independent claim 10. No new matter has been added.

In the Office Action, the Examiner rejected claims 1 and 4-8 under 35 U.S.C. § 103(a) as being unpatentable over Akiba et al. (U.S. Patent No. 5,429,710). In view of the foregoing amendments and the following remarks, Applicants respectfully request reconsideration and withdrawal of this rejection.

Each of new claims 10-15 is drawn to a different combination of method steps that is patentable over the disclosure of Akiba et al. In particular, Akiba et al. fails to disclose the claimed invention because it fails to teach or suggest, among other things, a method step of "etching a SiO<sub>2</sub> layer selectively to the SiN<sub>x</sub> film layer," as recited in independent claim 10.

Akiba et al. discloses two-step etching process for forming a via-hole in an interlayer insulating film on an Al-1% Si layer. The two-step etching process is carried out using a c-C<sub>4</sub>F<sub>8</sub>/CH<sub>2</sub>F<sub>2</sub> mixed gas system and a c-C<sub>4</sub>F<sub>8</sub> sole gas system. Akiba et al., however, fails to disclose a step of "etching a SiO<sub>2</sub> layer selectively to the SiN<sub>x</sub> film

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layer," recited in claim 10. In fact, Akiba et al. does not even disclose the use of  $\text{SiN}_x$  film layer for covering the surface of the insulating film layer so as to prevent gates during etching process.

While admitting the deficiencies of Akiba et al., the Examiner asserts that "it would have been obvious to one skilled in the art to employ  $\text{SiN}_x$  as the antireflective film on the surface of the Al wiring layer formed in the process taught [by Akiba et al.]." In support of his assertion, the Examiner alleges that the usage of  $\text{SiN}_x$  to form an antireflective film on a wiring layer is conventional, and that the alleged combination would simply involve the usage of an alternative, equivalent means of forming an antireflective film on the Al wiring layer in the process of Akiba et al.

Applicants respectfully disagree with the Examiner because the alleged combination requires more than applying an alternative, equivalent means of forming an antireflective film. Akiba et al. discloses an antireflection film used in connection with the Al-based interconnection layer for improving processing accuracy in photolithography (e.g., col. 8, line 64 - col. 9, line 3). This statement, however, is not only inconsistent, but includes no disclosure as to how and in what manner the antireflection film is provided in the Al-based interconnection layer. In general, when a target film to be etched is directly coated with a photoresist film, a specific opening part will spread as the irradiated light from the top of the photoresist is diffusely reflected from the target film due to the rough surface of the target film. In order to prevent this, after forming an opening part on a photoresist layer by a photolithography process, the photoresist layer is coated with an antireflection film (with a relatively smooth surface) on the target film. As becomes apparent, providing an antireflection film between an Al-

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based interconnection layer and an interlayer insulating film is inconsistent with the purpose of "improving processing accuracy in photolithography" because an antireflection film does not improve processing accuracy in photolithography.

Regardless of how and where the antireflection film is provided in Akiba et al., merely providing an antireflection film does not automatically mean that the Al-based interconnection layer is etched selectively to the antireflection film. In fact, Akiba et al. discloses that a via-hole is formed toward an Al-based interconnection layer, in which an antireflection film, if provided, will be eventually etched through during the etching process. The present claimed invention is patentable distinguishable over the disclosure of Akiba et al. at least because the claimed invention recites etching "selectively to the  $\text{SiN}_x$  film layer."

At least for these reasons, claimed invention defines novel and non-obvious subject matter of Akiba et al. Thus, Applicants respectfully request reconsideration and withdrawal of this rejection.

### **CONCLUSION**

Applicants respectfully request the reconsideration of this application and the timely allowance of all pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

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Respectfully submitted,

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